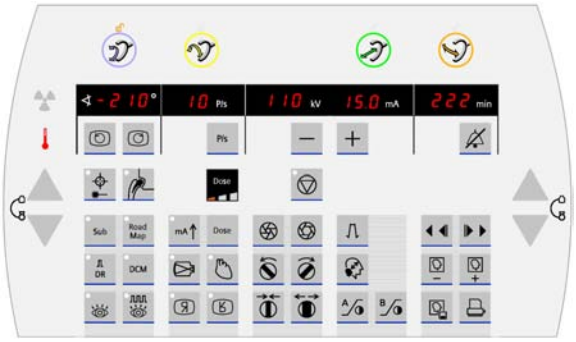
ARCADIS Avantic

VB 13C

Quick Guide

SIEMENS
medical

C-arm control panel



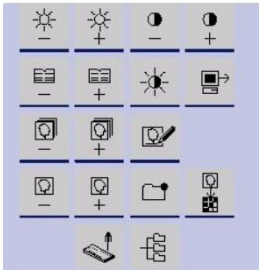
upper/lateral keys

Brakes for C-Bogen movement orbital, angular, horizontal longitudinal, horizontal swivel	
Lift/lower C-arm	Rotate image
Switch laser light localizer on/off	Switch metal function on/off
Set pulse rate	Reduce/enlarge kV/ mA
Control stop (ADR stop)	Switch off acoustic-warning signal

lower keypads

Sub, Road Map, DR, DCM - Subtraction - Roadmap - Digital radiography - Digital Cine Mode	- Continuous fluoroscopy - Pulsed fluoroscopy
Switch Power Mode on/off	Select dose level (with display)
Set zoom factor for live image	Selecting the noise reduction factor
Image reversal horizontal, vertical	Open, close iris diaphragm
Rotate slot diaphragm	Open, close slot diaphragm
Set degree of edge enhancement	Enlarge/reduce saved images (zoom in/out)
Contrast adjustment for left/right monitor	Digital Cine Mode review (DCM)
Read image from memory forw., backw.	Save, print image

Monitor trolley symbol keypad



		Brightness –/+	
		Contrast –/+	
		Scroll to previous/next study	
		Scroll to previous/next series	
		Scroll to previous/next image	
	Switch between negative and positive image		Send to network node 1
	Enter a study comment		Mark image
	Copy to film sheet		Call up Patient Registration
	Select Patient Browser		

ARCADIS Avantic Quick Guide

CE 0123

This product is provided with a CE marking in accordance with the regulations stated in Directive 93/42/EEC of June 14th, 1993 concerning medical devices.
The CE marking applies only to medical devices which have been put on the market according to the above-mentioned EC Directive.

The original language of this document is German.

This Quick Guide is available in German, English, French, Italian and Spanish.

Introduction

We welcome you as a user of the powerful ARCADIS Avantic C-arm system from Siemens.
This clearly laid out Quick Guide is intended to guide you through the operation of the system.

The Quick Guide is valid only in conjunction with the Operator Manuals and the safety information they contain:

- ❏ Please observe the Operator Manual and all supplements/addenda
- ❏ Please observe all safety information

The right-hand pages contain step-by-step instructions corresponding to the typical workflow in the OR.

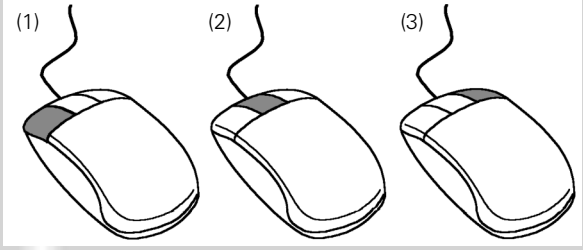
The pages to the left contain illustrations and and supplemental notes.

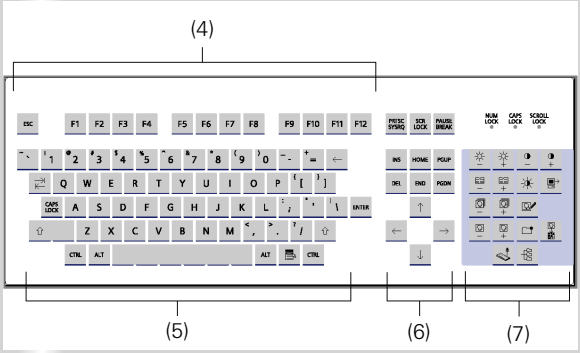
The description focuses on easy and fast operation of the ARCADIS Avantic from start-up through to shutdown of the system including optional functions such as connection to a hospital network or subtraction.

More detailed and complete descriptions can be found in the ARCADIS Avantic Operator Manual.

Table of Contents

This chapter is addressed to *syngo* beginners and users with little computer experience.





Functions of the symbol keypad see fold-out cover.

This chapter provides you with basic information on the input devices of the computer at the monitor trolley and on the *syngo* user interface.

Input devices

The mouse

(1) Left button
Single click: select/mark
Double click: load data/program
Button kept pressed: drag/move

(2) Middle button
Button kept pressed: windowing (change brightness and contrast)

(3) Right button
Single click: call up popup menu (context-sensitive)

The keyboard

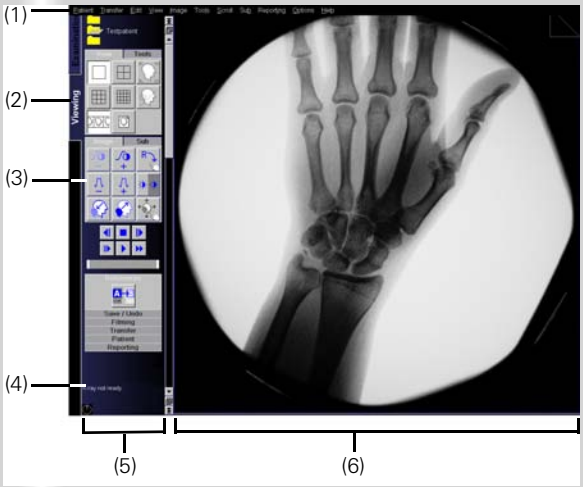
(4) Function keys
F1 = *syngo* Online Help

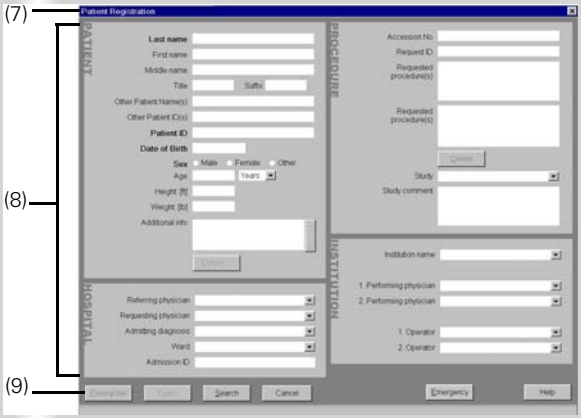
(5) Alphanumeric keypad
Text input, e.g. patient data

(6) Cursor keypad
Movement of the mouse pointer in texts

(7) Symbol keypad
Direct selection of important *syngo* functions (e.g. calling up Patient Registration or local database; image postprocessing functions)

After the ARCADIS Avantic system has been switched on, the *syngo* user interface automatically appears on the monitor trolley screens.





syngo user interface

syngo consists of several stacked task cards. These are assigned to the individual steps of the workflow.

Task cards

(1) Menu bar
Calling up of main menus and submenus

(2) Tabs
Selection/switching of task cards

(3) Stack of subtask cards
Selection of processing tools and display functions
Switching of subtask card via tab

(4) Status bar
Display of system messages

(5) Control area
Display of image and examination parameters, selection of functions (via subtask cards)

(6) Image area
Display and processing of images

Windows/Dialogs

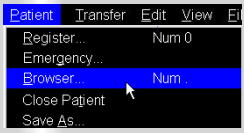
Windows are called up separately or displayed automatically.

Windows can be closed again after processing.

(7) Title bar
Name of window, "Close window" button

(8) Window content
Input and selection of data

(9) Softkeys/buttons
Confirmation or cancellation of actions and messages



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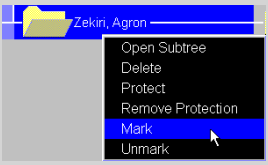

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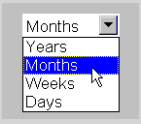

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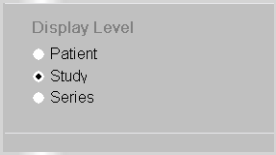

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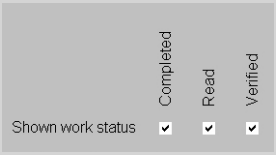

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(8)

(9)

(10)

syngo control elements

Control elements on the screen are easiest selected with the mouse.

Menus

(1) Main menu
Opens by pressing left mouse button

(2) Popup menu
Opens by pressing right mouse button
The content depends on the mouse position ("mouse focus") on the screen

Input elements

(3) Text input field

(4) Selection list
Selection of preset parameters and data; opens via arrow

(5) Spin box
Setting of values with arrow keys

(6) Radio buttons
Only one option selectable

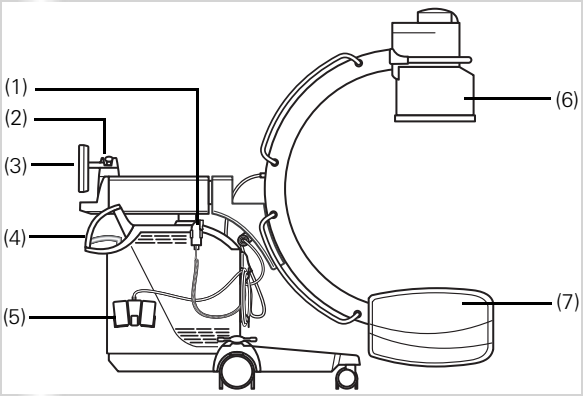
(7) Check box
Several options selectable

Icon buttons

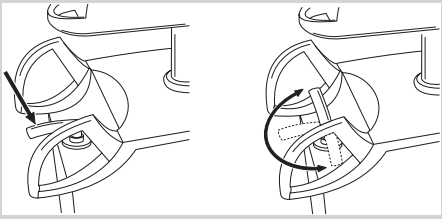
(8) Dimmed
Function not selectable

(9) Inactive
Function selectable, but not active

(10) Active
Function activated



As soon as you press the emergency stop button, motorized up and down movement of the C-arm system is disabled.



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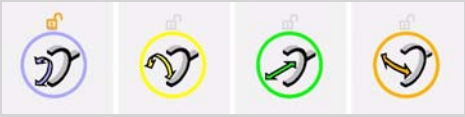


C-arm system

C-Arm

(1) Hand switch

(2) Emergency stop

(3) Control panel

(4) Steering lever

(5) Holder for footswitch

(6) Image intensifier

(7) X-ray tube

Steering

(4) Steering lever

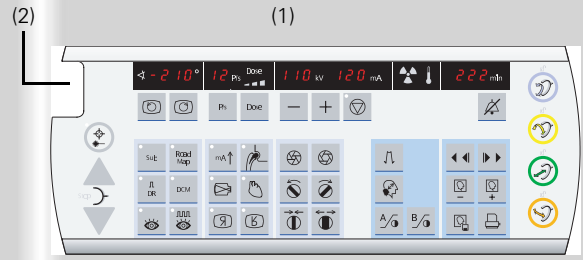
❏ Steering lever straight:
Move C-arm system straight ahead

❏ Steering lever set to the left or right:
Move C-arm system in transverse direction e.g. parallel to the table

Brakes

(8) Electromagnetic brakes on the control panel and optional remote control unit

❏ Brake for the desired direction of movement released (display of open lock):
Move C-arm system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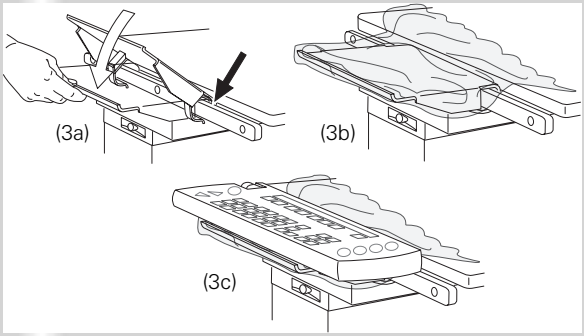
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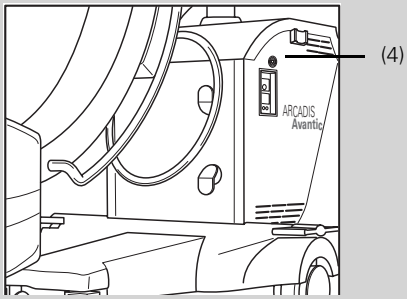
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ARCADIS
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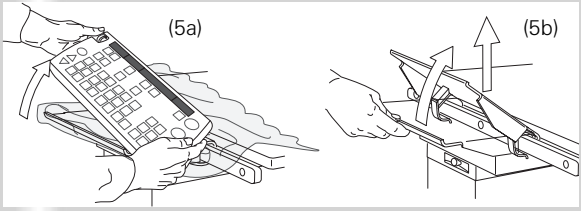

(5a)
(5b)

Remote control unit (option)

The remote control unit is used in the same way as the control panel on the C-arm system.

(1) Displays and buttons of the remote control unit

(2) Integrated EMERGENCY STOP button

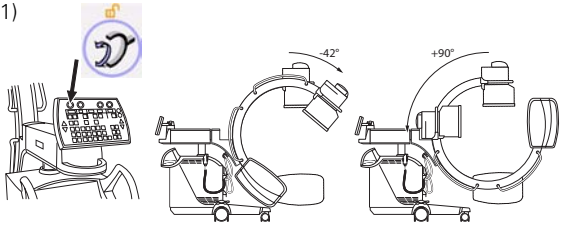
(3) Installation on the patient table
(a) Fit the adapter plate diagonally on the table railing and fold it down (engages)
(b) Pull the sterile patient drapes over the adapter plate
(c) If necessary, put the remote control unit in the sterile cover provided and mount it (attaches magnetically)

(4) Connection on the C-arm system (above monitor trolley connector)

(5) Removal from the patient table
(a) Remove the remote control unit by slightly tilting it to the side
(b) Fold the adapter plate up again and pull it off.

⇨ Storage on the side of the monitor trolley: Attach the remote control unit magnetically. Fit the adapter plate diagonally in the railing holder and fold it all the way down.

(1)



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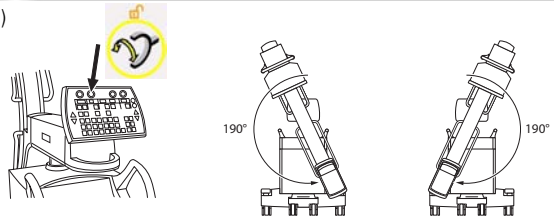

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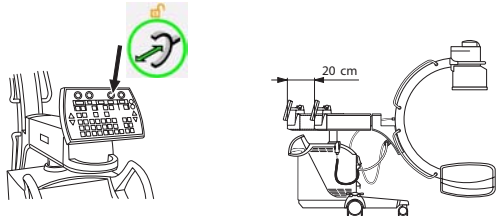


When moving the support arm from the outer area (12 – 0) into the collision area (0 – 8), you will have to override a slight resistance at the 0 position (safety stop).

Moving the C-arm system

Release the brakes to perform the following movements.

(1) Orbital movement
Change between a.p. and lateral position

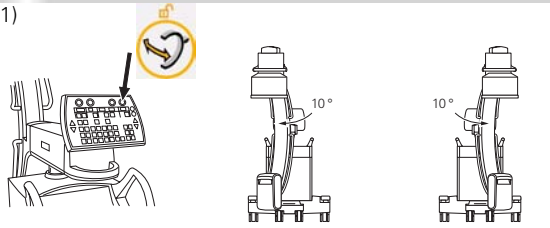
➪ Starting from the basic position (0°), the C-arm swivels up to +90° or up to –42° (132° in total).

(2) Angulation
Rotate C-arm about support arm in vertical plane
by up to 190° in both directions.

(3) Horizontal travel
Move C-arm horizontally
up to 20 cm

➪ Ideal for fine adjustments directly at the OR-table.

(1)



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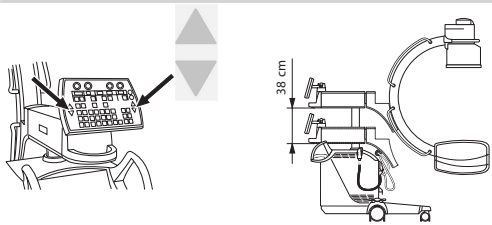
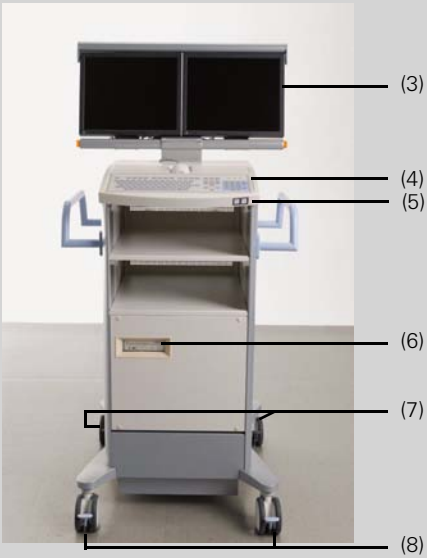




Description of keyboard see Basics chapter.

(1) Swivel
Swivel C-arm about unit column in horizontal plane
by up to 10° in each direction

(2) Vertical travel (motorized)
Lift and lower C-arm
up to 38 cm

⇨ Ideal for fine adjustments directly at the OR-table.

Monitor trolley

(3) TFT flat screen monitors

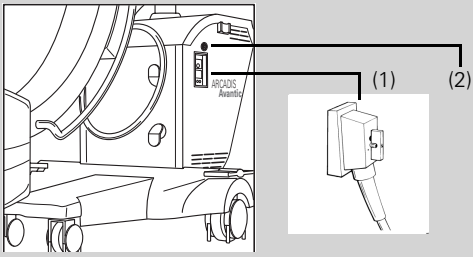
(4) Keyboard

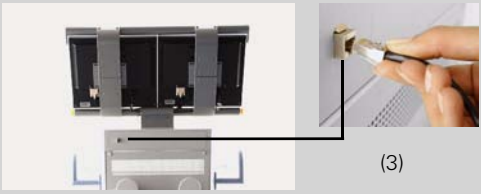
(5) Power on/off switch

(6) CD drive

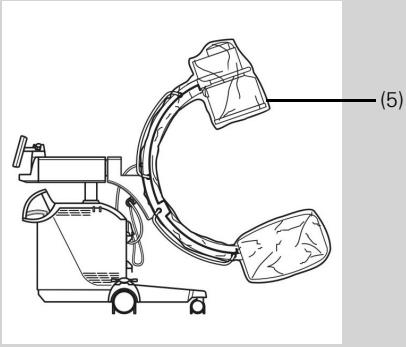
(7) Direction locks on the back wheels

(8) Brakes on the front wheels





If an additional access control mechanism is configured for the system, you have to log in with your name and password.



Preparing the system

Connecting, switching on and booting

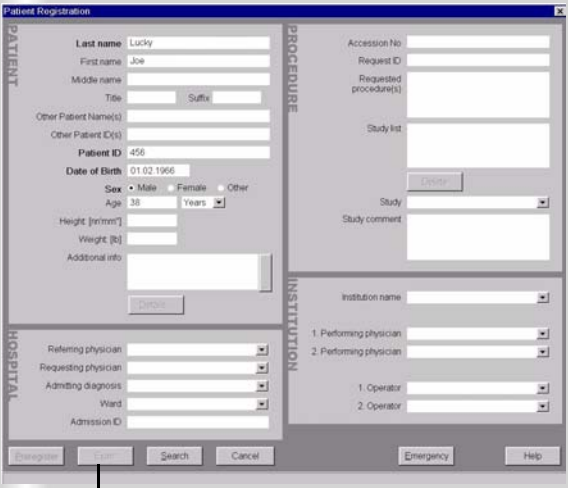
- ✧ Connect the monitor trolley connecting cable to the C-arm system (1).
- ✧ If necessary, plug in the cable of the remote control unit (2).
- ✧ If available, connect the network cable (if the system is connected to an information system or network printer) (2).
- ✧ Plug the power plug into the power outlet.
- ✧ Switch on the C-arm system at the monitor trolley (3).
- ➪ The system boots.

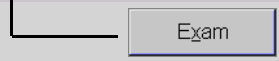
Covering the C-arm with sterile covers

- ✧ If necessary, cover the C-arm, e.g. with the three-part sterile cover (4).

During operation, the window can be opened by pressing the **Patient Registration** icon button on the monitor trolley.

(1)





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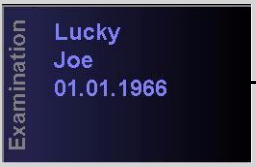


(3)

Patient registration

First, the **Patient Registration** window (1) appears directly.
(*Here*: maximal configuration)

✧ Enter the patient data into this mask (1).

At a minimum, the bold fields must be filled out.

✧ Using the mouse, click on the **Exam** (2) button.

➪ The patient data appear in the **Examination** task card (3).

➪ The unit is now ready to start an examination.

Alternatives

❑ Preregistration/Scheduler

The patient has already been registered in the Scheduler, from where it can be loaded into the **Patient Registration** card.

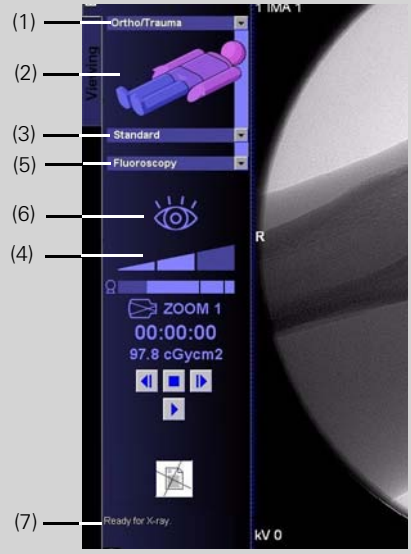
❑ Emergency

If the patient data are unknown, the patient is assigned a provisional number consisting of the date and the time of the entry. These data can later be corrected.

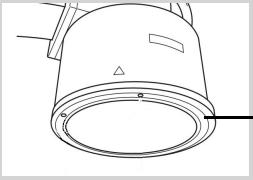
❑ Search

If an information network (e.g. hospital network) is connected, you can start a search for registered patients here.

To select parameters, use the mouse to click the monitor trolley.



If the optional laser light localizer is available, the object should be positioned with the laser light localizer, i.e. without radiation, as far as possible for reasons of radiation protection.

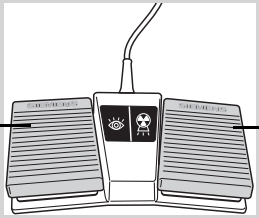


Preparation in the Examination task card

- ✧ Select the medical application area (1).
- ✧ Select the body region by clicking the VPA (Virtual Patient Anatomy) (2).
- ✧ Select the required application program (3).
- ➲ With the application program you simultaneously select a dose level (reduced, standard, increased). This is shown by a bar (4).
- ✧ Select the desired operating mode (5). *Alternative*: Select/switch operating mode on the C-arm keyboard (see cover) or using the optional multifunctional footswitch (→ Page 27).
- ➲ The selected operating mode is shown as a symbol (6).
- ➲ The readiness of the C-arm is shown in the status bar (7).

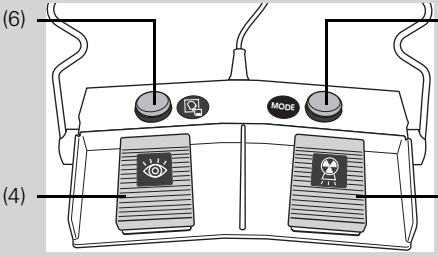
Setting with the laser light localizer

- ✧ Press the button on the C-arm system (8).
- ➲ Depending on your system version, either the I.I. laser aimer (9) (option) and/or the single-tank laser targeting device (option) is switched on.



If required, the footswitch assignment can be changed by Siemens Service.

Exception: If continuous fluoroscopy is set, pressing the footswitch releases a single exposure.



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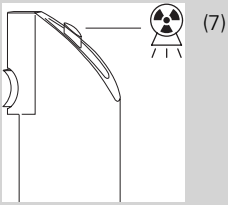


Radiation release and dose display

Radiation release with the footswitch

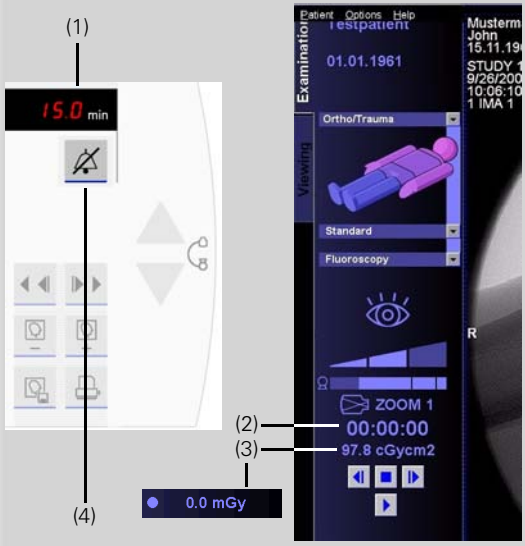
- ✧ Actuate the footswitch marked with the fluoroscopy symbol (1).
- ➲ Continuous fluoroscopy is released.
- ✧ Actuate the other footswitch (2).
- ➲ The set operating mode is activated.

Radiation release with the multifunctional footswitch (option)

- ✧ To change the operating mode set, press the operating mode button (3) several times.
- ✧ Actuate the footswitch marked with the fluoroscopy symbol (4).
- ➲ Continuous fluoroscopy is released.
- ✧ Actuate the other footswitch (5).
- ➲ The set operating mode is activated.
- ➲ Storage of the images displayed with the save button (6).

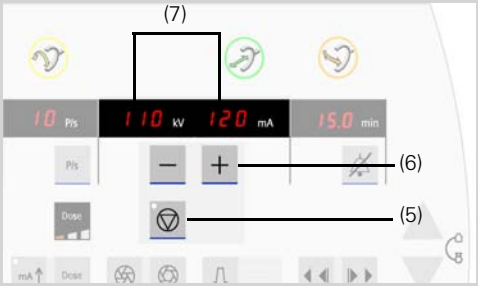
Radiation release with the hand switch

- ✧ Press the release button to release the set operating mode (7).



ADR stop is recommended, for example, for

- Thin objects, e.g. wrist (the movement causes the object to slide out of the central beam, the image is underexposed)
- Metal (high density of the metal leads to strong overexposure)
- Transition between thoracic and lumbar spine (movement of the diaphragm/ midriff causes changes in the exposure).



Radiation time and dose display

(1) Display of accumulated fluoroscopic time at the C-arm system

(2) Display of accumulated fluoroscopic time at the monitor trolley (**Examination** task card)

(3) Display of accumulated dose at the monitor trolley (with optional dose measuring chamber)
Alternative: Display of air kerma values (preceding item: accumulated air kerma).

➲ After every five minutes of radiation, an audible alarm sounds at the C-arm system.

✧ To deactivate the warning signal, press the button (4) on the C-arm system.

Manual entry of radiation parameters

All exposures are taken with automatic exposure control.

This rule is turned off using **ADR stop**. The kV/mA values can then be selected manually.

✧ Select **ADR stop** at (5).

✧ If required, set a manual value with the **+/-** buttons (6).

➲ kV and mA values are shown on the display at the C-arm system (7).

➲ As long as **ADR stop** is activated, the manually set value remains unchanged.

In the DCM mode the **Power Mode** function is automatically selected.

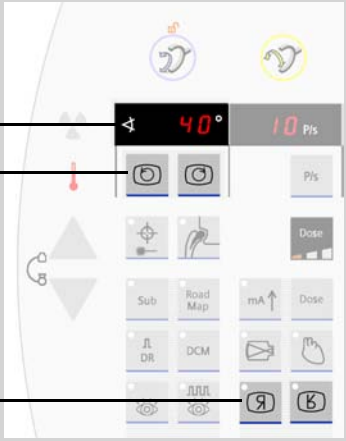
Power mode

Power Mode is an additional function for the fluoroscopy mode.

With **Power Mode** a higher contrast is achieved, but with a higher dose.

- ✧ Select the **Power Mode** function at the C-arm system (1).
- ➪ If the **Power Mode** function is activated, a continuous warning signal sounds during fluoroscopy.
- ➪ The duration of the **Power Mode** function is limited to 15 s.

The rotation is performed without radiation and can be observed on the monitor.



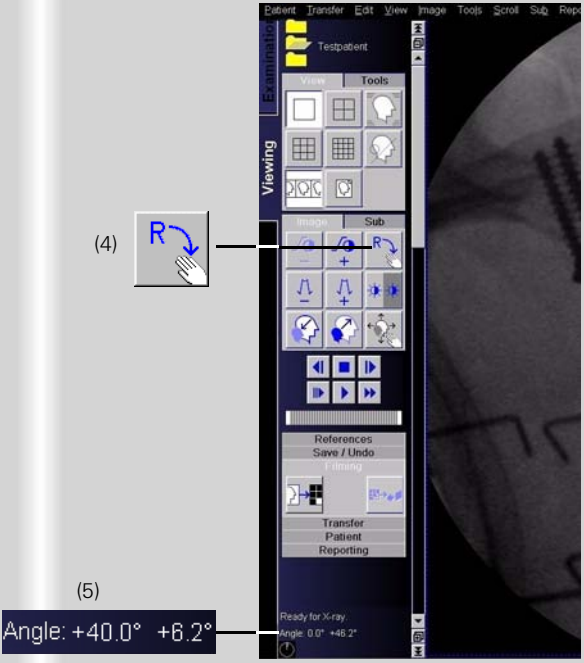


Image rotation and reversal

At the C-arm system

- ✧ Press one of the **image reversal** buttons to flip the image horizontally or vertically (1).
- ➪ The display of the fluoroscopic image is updated correspondingly.

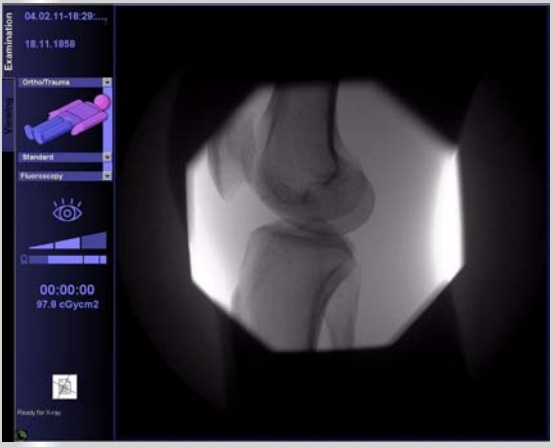
- ✧ Press one of the **image rotation** buttons for the required direction of rotation (2).
- ➪ The angle of rotation in relation to the starting position is shown (3).

At the monitor trolley

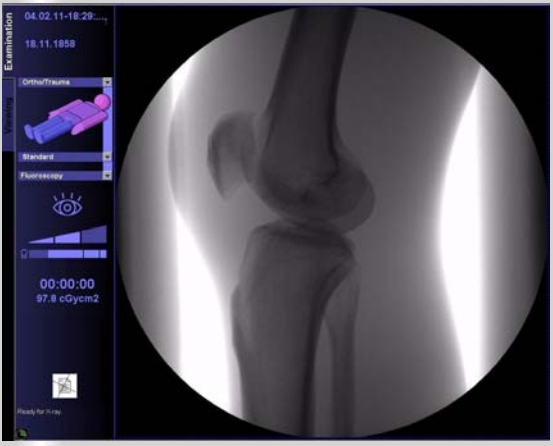
Image display and processing in the **Viewing** task card is possible only for stored images (e.g. single exposure) (in the **Examination** task card you can rotate images with the mouse at any time).

- ✧ Activate the image rotation function in the **Viewing** task card (4).
- ✧ Rotate the image with the left mouse (keep left mouse button pressed).
- ➪ Angle display in the control area (5):
  First value = angle of rotation in relation to starting position.
  Second value = angle of rotation in relation to last image setting.


110 kV
120 mA
15.0 min
(1)
(2)
(3)


04.02.11-18:29:...
Examination
18.11.1858
OrthoTrauma
Standard
Fluoroscopy
00:00:00
97.8 cGycm2
Ready for X-ray

(4)


04.02.11-18:29:...
Examination
18.11.1858
OrthoTrauma
Standard
Fluoroscopy
00:00:00
97.8 cGycm2
Ready for X-ray

(5)

Collimator setting

The diaphragms allow optimal collimation to a specific object. They can be set at the C-arm system.

(1) Moves the iris diaphragm into/out of the beam path

(2) Rotates the semitransparent diaphragm

(3) Moves the semitransparent diaphragm into/out of the beam path

The iris diaphragm is a multileaf collimator. It is used preferably for collimating smaller objects in the image center.

- ✧ Activate the iris diaphragm for small objects, e.g. the wrists (1).
- ➪ The X-ray beam is limited to an octagon (4).

The semitransparent diaphragm acts as a density compensation. It is used to collimate to extremities, for example.

- ✧ Rotate the semitransparent diaphragm corresponding to the position of the object (2).
- ✧ Adapt the semitransparent diaphragm to the size of the object (3).
- ➪ A diaphragm is moved close to the object on both sides. This prevents overexposure at the edges of the object (5)


-210°
10 P/s
P/s
Dose
(2)
Sub
Road Map
mA
Dose
(1)
DR
DCM


-210°
10 P/s
P/s
Dose
(3)
Sub
Road Map
mA
Dose
(4)
DR
DCM

Image Quality

Selecting the dose level

You can select up to three different dose levels (reduced, standard, increased).

- ✧ Press the **dose level** button several times until the required value is reached (1).
- ➪ The currently set dose level is shown in the bar display on the monitor and in the segment display (2).

Activating the metal function

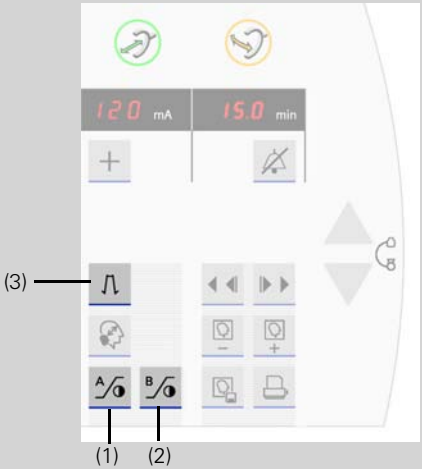
If there is metal in the measuring area you can optimize contrast and brightness by activating the metal function.

- ✧ Press the **metal function** button (3).
- ➪ The LED is on when this function is selected.

Lowering noise reduction

You can select a lower integration factor for exposures of fast moving objects. With normal noise reduction, a higher integration factor is selected (for very slow movements).

- ✧ When there is motion in the image, press the **Noise reduction factor** button (4).
- ➪ The LED lights up, noise reduction is lowered.


120 mA
15.0 min
(3)
(1)
(2)

Changing the contrast

If the image quality is insufficient, a different gray-level curve can be selected at the control panel of the C-arm system during the examination to change the contrast of the image (and all further images).

In addition, the edge enhancement of the live images can be changed.

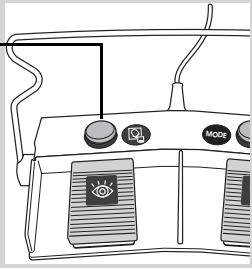
✧ If necessary, repeatedly press the following buttons to change between preset values:

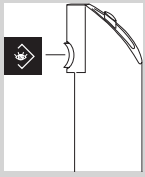
(1) Change contrast left monitor (**Examination** task card)

(2) Change contrast right monitor (**References** task card)

(3) Change edge enhancement left monitor (**Examination** task card)

At the end of radiation, the image last acquired is displayed (LIH, Last Image Hold). If radiation is released again, the LIH image is overwritten.





Saving images

Single exposure, Digital Cine Mode (DCM)

In these operating modes the generated images are automatically saved in the local database of the **Patient Browser**.

Fluoroscopy, pulsed fluoroscopy, subtraction, Roadmap

In these operating modes images are stored in the temporary image memory and overwritten by new images.

✧ To manually save the current image, press one of the following buttons:

(1) **Save image** button on the multifunctional footswitch (option)

(2) **Save image** button on the hand switch

(3) **Save image** button on the C-arm system

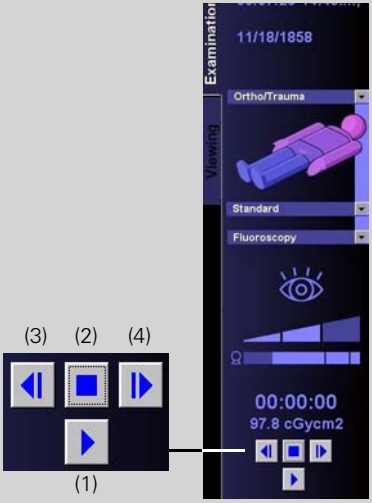
➪ This image is displayed in the **References** task card and stored in the local database.

Scrolling and printing

✧ Review image series as a movie in the **Examination** task card (4).

✧ Scroll backward/forward through the stored images in the **References** task card (5).

✧ Print out individual images from the **References** task card with a local printer (option) (6).



If **Autoloop** (option) is configured in the exam set used, review of the scene is started automatically at the end of radiation.

You can load the scene into the **Viewing** task card at any time and review it there.

If the MPPS option is installed, the **Modality Performed Procedure Step** window for performance documentation is now displayed automatically.

In the Configuration menu (**Options > Configuration > Transfer**), define the rules for auto transfer, e.g.:

- ❏ Required processing status
- ❏ Target addresses
- ❏ Data type

Fluoro Loop/LSH (option)

In the fluoroscopy, subtraction and Roadmap modes, scenes can be reviewed and stored (Last Scene Hold) during the examination.

Reviewing a scene

After radiation is ended, the buttons for controlling the scene review are displayed.

(1) Start

(2) Stop

(3) Previous frame

(4) Next frame.

Storing the scene

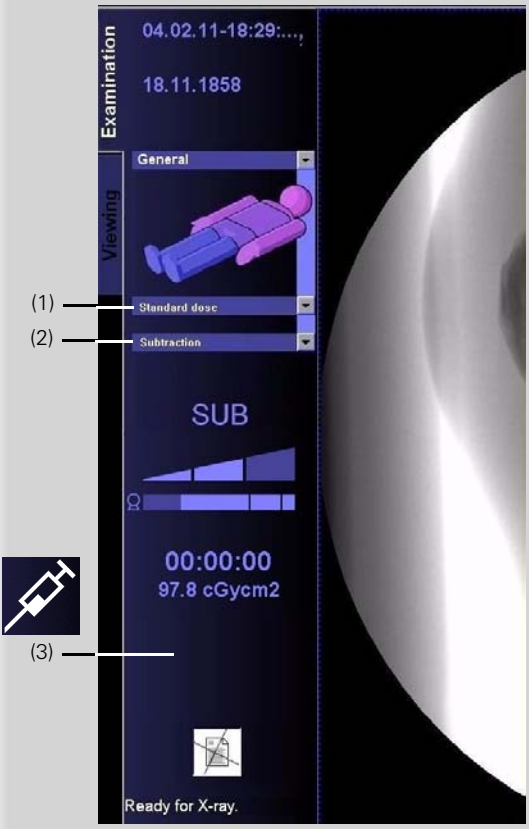
As soon as the scene has been reviewed, it can be stored.

- ✧ Select **Patient > Save LSH Scene** in the main menu or press function key F9 on the keyboard.
- ➪ The current scene (up to 120 images) is stored in the local database.

Ending the examination

- ✧ Select **Patient > End Examination** or press function key F4 on the keyboard.
- ➪ Patient and examination data are deleted from the **Examination** card.
- ➪ If **Automatic transfer** is active, the examination images are automatically saved to CD-R or sent to the information system (option).

The **Subtraction** and **Roadmap** modes are an option for C-arms used in cardiac and vascular surgery.



Performing a subtraction scene

Contrast medium injected into the vessels helps to show vessels and changes of/in these vessels (e.g. aneurysms, ruptures).

Procedure

✧ Prepare the examination in the **Examination** task card:

(1) Selection of the required application program

(2) Selection of the **Subtraction** mode

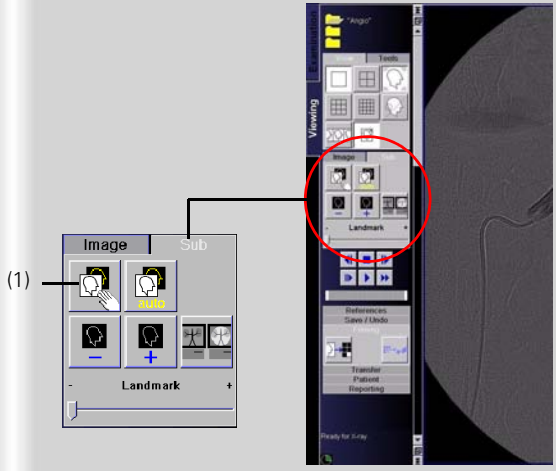
✧ Trigger the subtraction scene with the footswitch or the hand switch.

The footswitch or hand switch must remain pressed during the entire series. If the series is interrupted, it must be started again from the beginning.

(3) The syringe symbol appears in the **Examination** task card. The physician now injects the contrast medium.

➪ After a few seconds the syringe symbol disappears again. The physician can end the contrast medium injection. The contrast medium bolus remains displayed.

If **auto store** is activated in the configuration menu, the images of a subtraction scene are automatically saved in the local database. They can then be retrieved for postprocessing at the end of the examination.



Postprocessing a subtraction scene

✧ Load the subtraction scene from the **Patient Browser** into the **Viewing** task card, if required.

Pixelshift

Pixelshift allows you to make the mask and fluoroscopy image coincide.

This function is used if the position of the patient has changed in the course of the series in relation to the position of the mask.

✧ Click the **Pixelshift** button (1).

➪ The mouse pointer appears as an arrow.

✧ Using mouse clicks, move the mask and fluoroscopy image so that one is on top of the other.

➪ In the lower image area it is indicated by how many pixels the mask was shifted in the x-plane (= to the left or right) or the y-plane (= up or down).

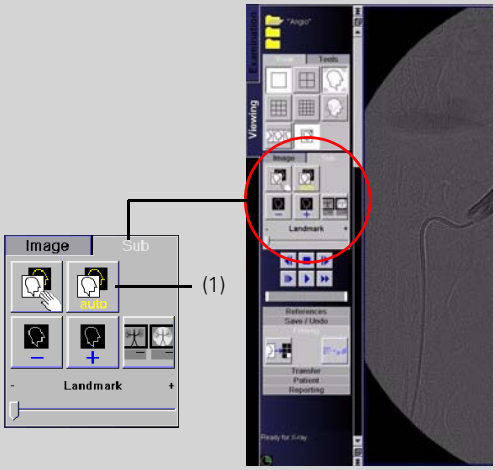


Image
Sub
(1)
Landmark
Viewing
Landmark

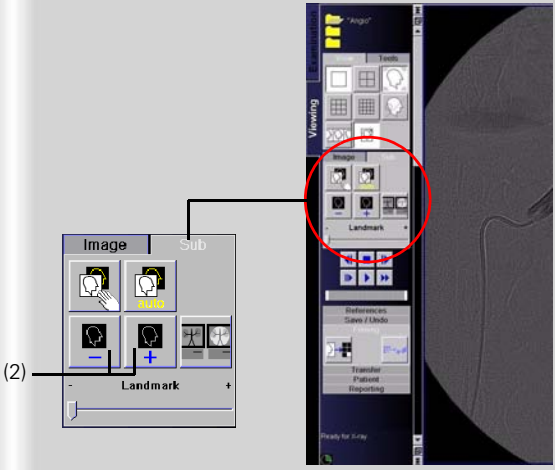


Image
Sub
(2)
Landmark
Viewing
Landmark

Auto Pixelshift

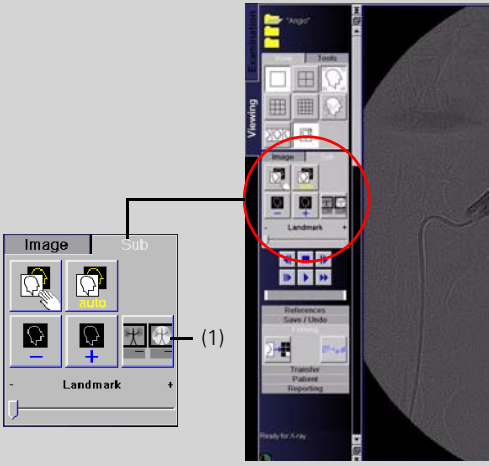
This function allows automatic pixelshift for a selected region.

- ✧ Click the **Auto Pixelshift** button (1).
- ➪ The mouse pointer changes into a square.
- ✧ With the left mouse button pressed, move the square to the location where you want to achieve coincidence.
- ✧ Release the mouse button again.
- ➪ The mask and fluoroscopy image are made to coincide optimally in the marked area.
- ➪ The shift of the mask in the x- and y-axis is indicated in the bottom right image area.

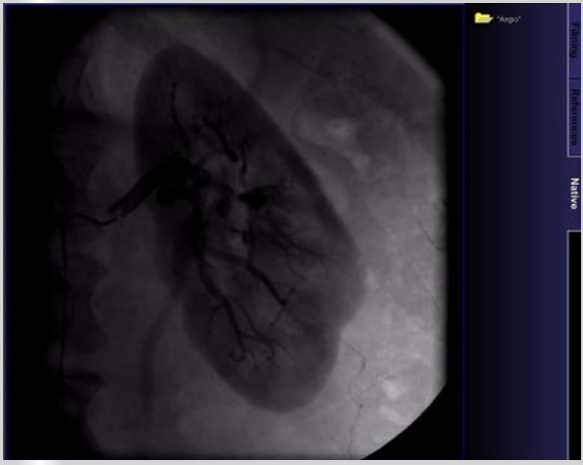
Selecting a different mask

The selected application program defines which of the generated images is used as the mask in the subtraction series. This image is then subtracted from all following images.

- ✧ Click on **Mask +** (Next) or **Mask –** (Previous) (2).
- ➪ The mask for this series is changed in individual steps. This change is automatically adopted for the entire series.



(2)



Dual channel function

With this function the entire series is displayed unsubtracted during postprocessing in the **Native** task card (on the right-hand monitor).

At the same time, the subtracted display is shown in the **Viewing** task card (on the left-hand monitor).

- ✧ Click the **Dual channel function** button (1).
- ➪ The entire series is additionally shown unsubtracted on the right-hand monitor, even when scrolling through individual images of the series.

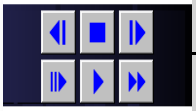
Native display in the Native task card

The image shown in the **Native** task card directly corresponds to the image of the series shown in the **Viewing** task card (2).

- ✧ Scroll through the individual images of the series in the **Viewing** task card.
- ➪ The **Native** task card always shows the corresponding image unsubtracted.

(1)

(2) (3) (4)



(5) (6) (7)

Landmark

The **Landmark** function allows you to subsequently add an anatomical background for orientation purposes (0 to 30 %).

✧ Keeping the left mouse button pressed, drag the bar to the required value (1).

Movie mode

The replay of the subtraction scene can be repeated in the **Viewing** task card.

✧ Select the required function with the mouse:

(2) Scroll image back

(3) Stop the movie function

(4) Scroll image forward

(5) Replay series at half the speed

(6) Replay series in real time

(7) Replay series at double speed

During catheter placement the images are not automatically stored.

To manually save images, use the save button on the hand switch, on the multifunctional footswitch (option) or on the C-arm system.

It is not necessary to create a subtraction scene if the Roadmap exam connects to a subtraction angiography. The existence of a subtraction screen is then indicated by a screen icon.

- In this case, press the ROADMAP button on the control panel *once*.
- Immediately start catheter positioning under fluoroscopy control.

Roadmap

The Roadmap mode is also used in vascular surgery. This mode is used to place catheters in vessels under fluoroscopy.

The examination comprises the following steps:

Generation of a subtraction scene

✧ Select the Roadmap operating mode in the **Examination** task card.

The procedure is the same as that described in Section *Performing a subtraction scene*.

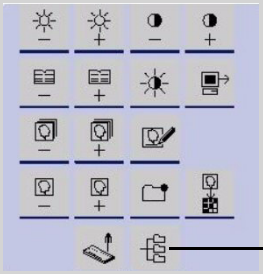
❏ First, a mask is generated.

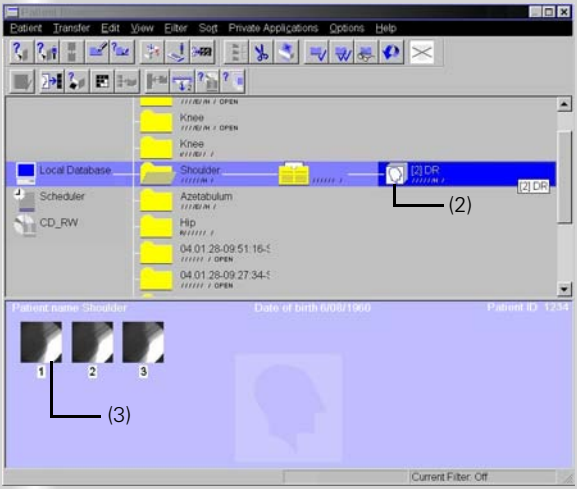
❏ Then, the vessel is filled with contrast medium and displayed using subtraction technique.

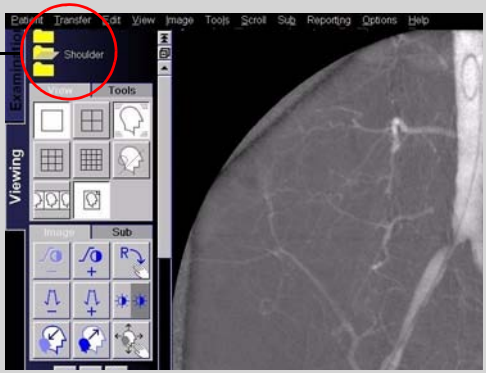
Catheter positioning in the vessel

❏ If radiation is released again, the catheter placement is shown in real time in the **Examination** task card.

Images are postprocessed in the **Viewing** task card.



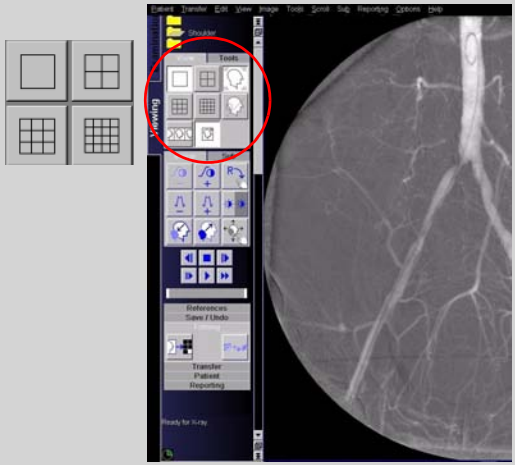




Loading patient images into the Viewing task card

- ✧ Open the **Viewing** task card.
- ✧ Open the **Patient Browser** with the **Call up Patient Browser** button on the monitor trolley (1).
- ✧ Load the required series into the **Viewing** task card with a double click (2).
- ✧ To load individual images, double-click on the image symbol (3).
- ➪ The name of the patient is displayed in the control area of the **Viewing** task card (4).

(1)



(2)

(3)

(4)

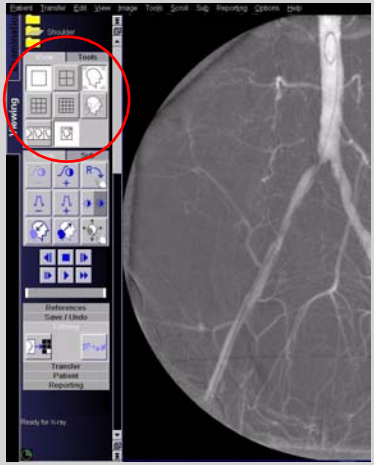


Image display

In the **View** subtask card you can choose between different monitor layouts.

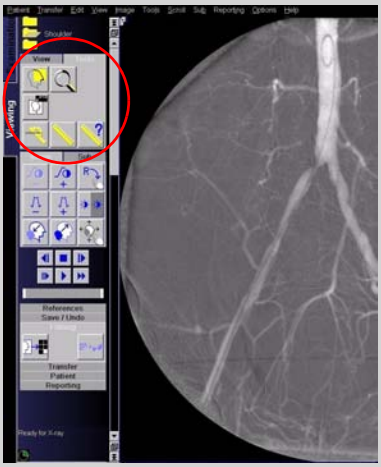
(1) Different screen divisions

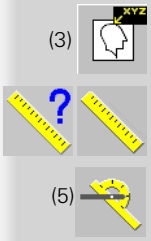
(2) Hiding graphics and patient data in the image area

(3) Stripe display:
the images of a series are arranged *next to each other*

(4) Stack display:
the images of a series are arranged *on top of each other*

(1) (2)

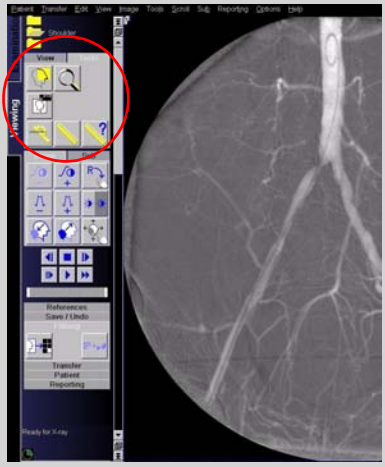




(3)

(4)

(5)



Measuring and annotations

In the **Tools** subtask card images can be measured and annotations can be added.

(1) Diaphragms
The subsequent simulation of diaphragms (drawn in with the mouse) improves the visualization of fine structures that are difficult to see in the image.

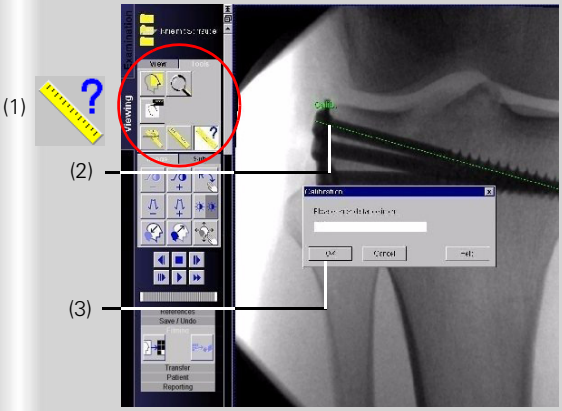
(2) Magnifying glass
Individual areas of the loaded image are shown enlarged at the mouse position with the left mouse button pressed

(3) Annotations
Selecting predefined or entering free annotations for image areas via the keyboard (with marking arrow)

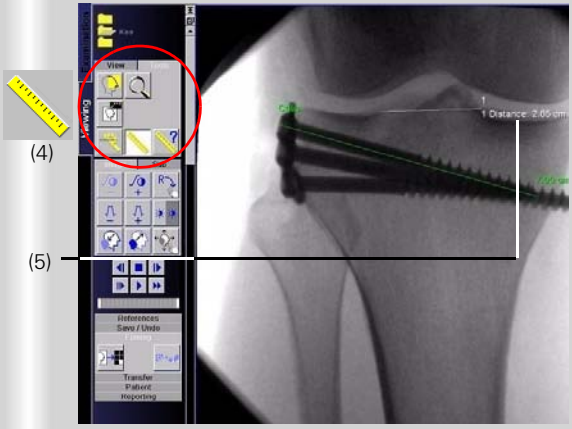
(4) Calibrating and subsequently measuring distances

(5) Angle measurement
The angle between two straight lines to be drawn is indicated

Distances cannot be measured directly in the images, since the position of the object in the beam path and thus the magnification effect is not clear. A calibration must be performed first before a distance can be clearly determined.



The calibration object must be perpendicular to the central ray in the area of the structure to be measured (generally in the center of the measuring field to avoid I.I. distortion).



Calibrating and measuring distances

❏ Calibrating (1st step)

✧ Activate the **Calibration** function by clicking the corresponding button (1).

➪ A line appears in the image area which can be lengthened, shortened and positioned as desired with the mouse (2).

✧ Draw the line along a known distance (2).

➪ As soon as you release the mouse button, a dialog box appears (3).

✧ Enter the known distance and confirm with **OK** (3).

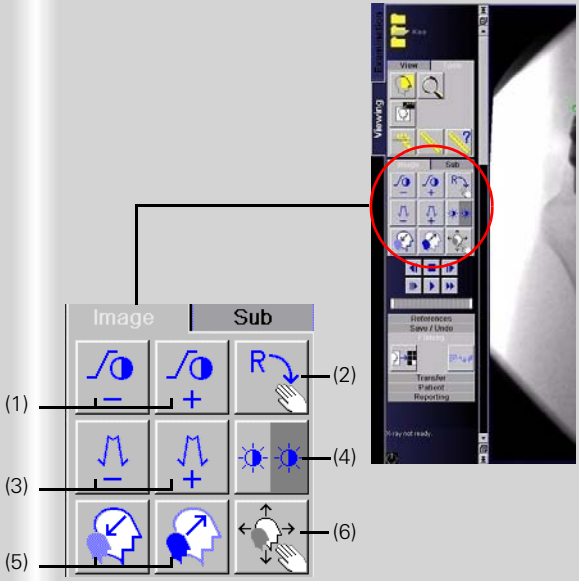
➪ The calibration is shown in the image area. At the same time, a measuring scale appears on the right edge of the image.

❏ Measuring distances (2nd step)

✧ Activate the **Distance** function by clicking the corresponding button (4).

✧ Using the left mouse button, draw a line along the required structure.

➪ As soon as you release the left mouse button, the distance from the start to the end point of this line is shown (5).



Edge enhancement (3) means artificially increasing the difference between two gray levels.

Image manipulation

Images can be postprocessed in the **Image** subtask card.

✧ Prior to postprocessing, activate the required function by clicking the corresponding button:

(1) Change of contrast
The contrast is changed in four defined steps

(2) Image rotation
Rotation with the left mouse button pressed

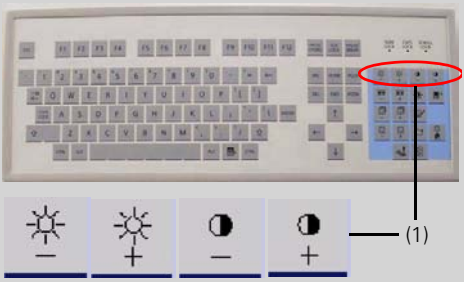
(3) Edge enhancement
Edge enhancement is increased/reduced in steps of ten

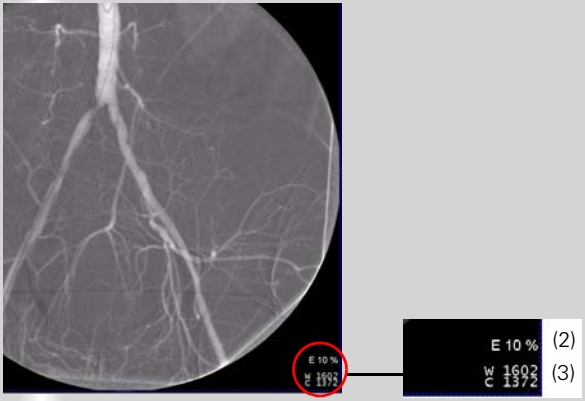
(4) Grayscale inversion
Change from positive to negative image

(5) Double/half image size

(6) Zoom/pan the image
Mouse at image edge: change image size
Mouse in image center: pan image

Windowing means changing the gray levels in an image and thus the brightness (center of the grayscale) and contrast (width of the grayscale) of the images.





Windowing

❏ With buttons/softkeys

✧ Select the preset contrast levels by clicking the buttons on the **Image** subtask card
(→ Page 65).

❏ With the keyboard of the monitor trolley

✧ Select the brightness and contrast step by step (1).

❏ With the mouse on the monitor trolley

✧ With the middle mouse button pressed, move the mouse in the image.
Up/down movement changes the brightness
Movement to the left/right changes the contrast

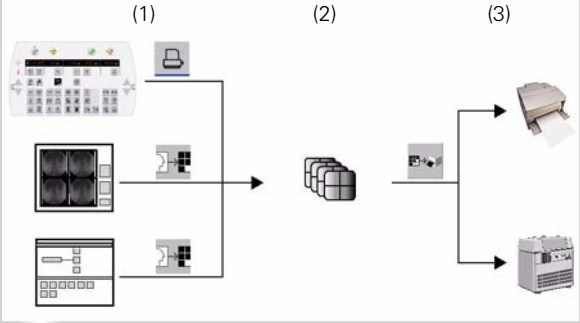
Display of window values

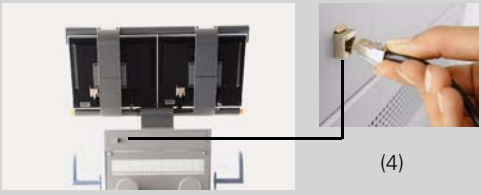
Edge enhancement and gray values of the image are displayed in the lower image area:

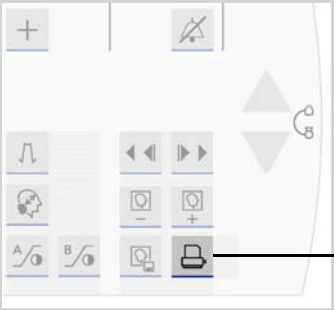
(2) Edge enhancement

(3) Grayscale window
W = window width (contrast)
C = window center (brightness)

In radiology the terms "filming" (= printing process), "camera" (= output device) and "exposing" (= printing) are used for the printing of patient images.
The *syngo* user interface uses corresponding terms.







Printing

If the printing function is configured, the **Filming** task card additionally appears on the right monitor.

Here, the images to be printed are collected in film sheets, processed if necessary, and then sent to the printer as a film job.

Procedure

(1) Copying images to the film sheet:
- from the C-arm system
- from the **Viewing** task card
- from the **Patient Browser**

(2) Editing/checking the film sheet:
in the **Film Preview** dialog or in the **Filming** task card

(3) Printing the film job:
- on a local printer
- on a network printer

With a local printer you can print individual images on paper or film directly in the OR.

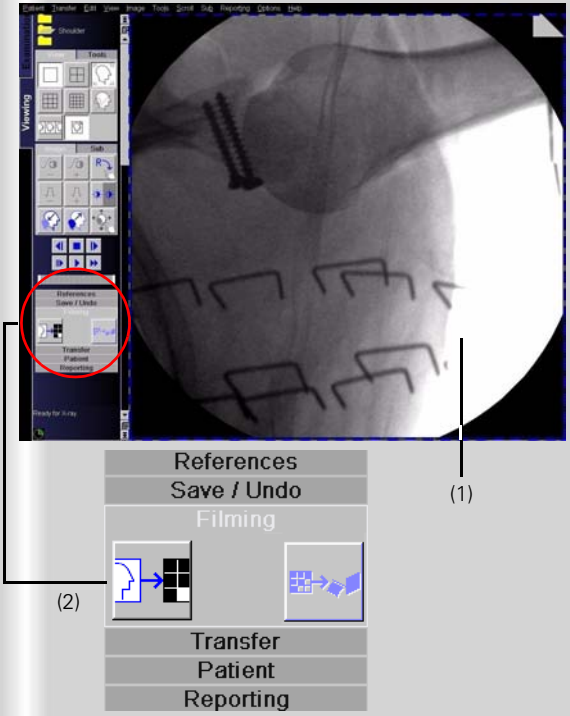
Printing in the network is possible if a network printer (e.g. central printer in the OR or the radiology department) is connected via the network connection (4).

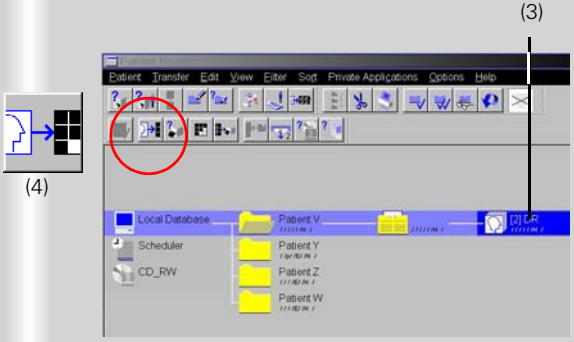
Copying images to the film sheet from the C-arm system (for local printing)

✧ Press the **Print** key on the control panel of the C-arm system (5).

➪ The image shown on the right monitor (**References** task card) is copied to the film sheet.

➪ The local printer is preset as output device for the print job.


References
Save / Undo
Filming
Transfer
Patient
Reporting
(1)
(2)


(3)
(4)
Patient Transfer Edit View Filter Sort Private Applications Options Help
Local Database
Scheduler
CD_RW
Patient V
Patient Y
Patient Z
Patient W

Copying images to the film sheet from the Viewing task card

Print jobs can be created in the **Viewing** task card in parallel with image postprocessing.

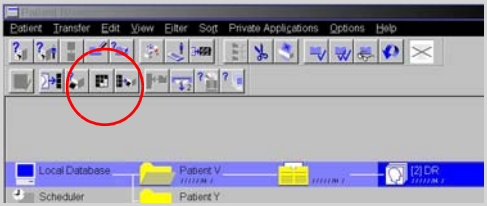
- ✧ Click the patient image to be copied to the film sheet (1).
- ✧ Then click **Copy to Film Sheet** (2).

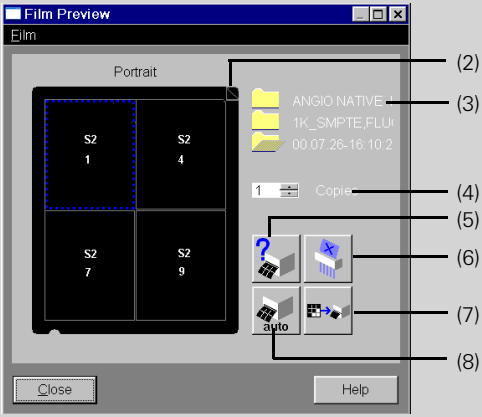
Copying images to the film sheet from the Patient Browser

If the complete data record of a patient is to be printed on film, this can also be done directly from the **Patient Browser**.

- ✧ Click the series to be printed in the local database of the **Patient Browser** (3).
- ✧ Copy the patient images to the film sheet (4).

(1)


Patient Transfer Edit View Filter Sort Private Applications Options Help
Local Database
Patient V
[2] DR
Scheduler
Patient Y


Film Preview
Film
Portrait
S2
1
S2
4
S2
7
S2
9
ANGIO NATIVE
1K_SMPTE_FLU
00.07.26-16:10:2
1
Copie
auto
Close
Help
(2)
(3)
(4)
(5)
(6)
(7)
(8)

Checking the film job and printing from the film preview

✧ Click the **Film Preview** button in the **Patient Browser** (1).

➪ A dialog box is opened which shows different functions for the film sheet:

(2) Dog ears for scrolling through the film sheets

(3) Patient name

(4) Setting the number of copies of a film job

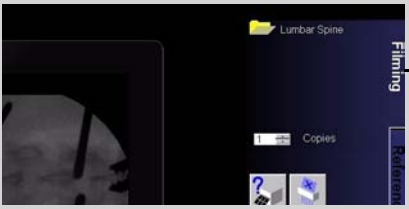
(5) Display of the status of individual film jobs, e.g. "queued", "completed" etc.

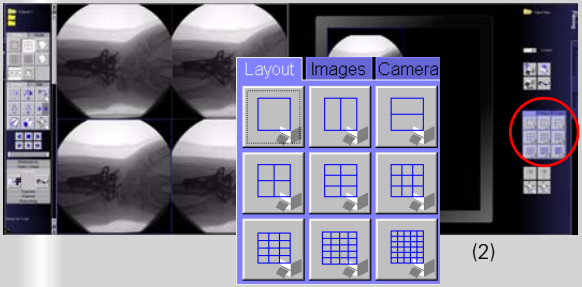
(6) Deleting individual images from the film sheet

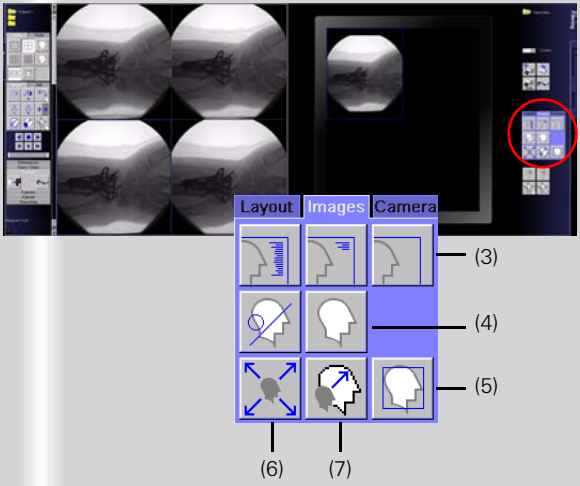
(7) Sending the film job and exposing/printing the film

(8) Automatic sending of a film job when film sheet is full

✧ Click **Expose** to send the film job to the printer/camera (7).


Lumbar Spine
Filming
Copies
(1)


Layout
Images
Camera
(2)


Layout
Images
Camera
(3)
(4)
(5)
(6)
(7)

Editing the film sheet in the Filming task card

✧ Click the **Filming** task card on the right monitor (1).

❏ Layout

✧ Select the required film layout in the **Layout** subtask card (2).

❏ Image display

✧ On the **Images** subtask card, select the required display of the images on the film:

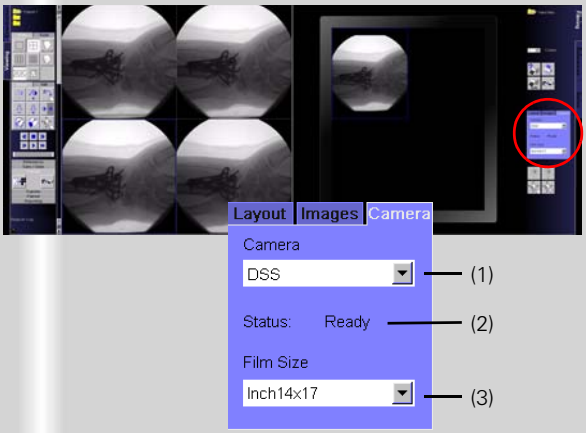
(3) Select text to be printed on film
All patient text (name, date of birth etc.), customized text or no text

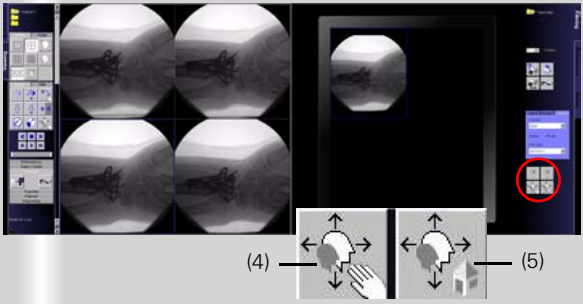
(4) Show or hide graphics (e.g. distance, angle measurements)

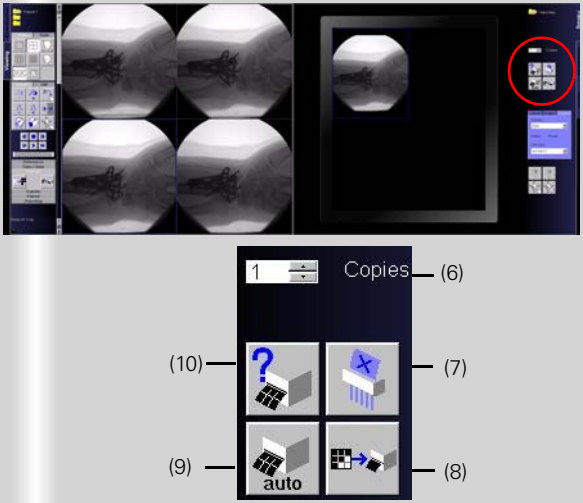
(5) Enlargement of the image so that the shorter sides fill the film segment. Parts can be cut off from the longer sides.

(6) Adjust the image size to the film segment

(7) Return to the original image


Layout
Images
Camera
Camera
DSS
(1)
Status:
Ready
(2)
Film Size
Inch14x17
(3)


(4)
(5)


1
Copies
(6)
(10)
(7)
(9)
auto
(8)

❏ Camera/printer setting

✧ In the **Camera** subtask card, select a different camera/printer or film size, if necessary:

(1) Select the camera if several cameras are configured

(2) Display of the film job status, e.g. "queued", "printed" etc.

(3) Select one of the film formats available in the camera

❏ Zoom/Pan

✧ Activate the function by clicking the corresponding button (4).

✧ Zoom/pan the image with the left mouse button pressed.
Mouse at image edge: change image size
Mouse in image center: pan image

✧ If required, reset the image to the original position and size (5).

Printing a film job from the Filming task card

✧ Set the number of copies (standard = 1 copy) (6).

✧ If necessary, delete individual images from the film sheet (7).

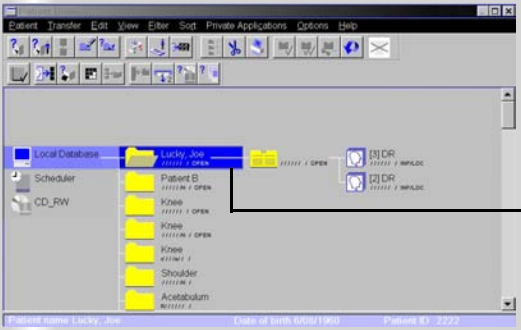
✧ Send the film job to the camera manually (8) or activate automatic exposure (9).

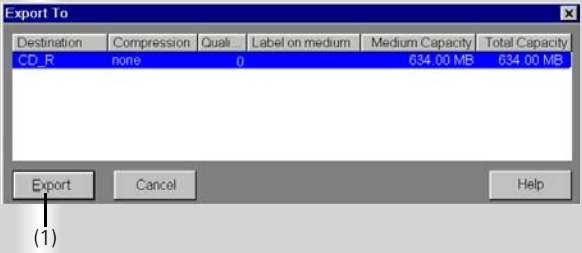
✧ If necessary, check the processing of the film job (10).

➪ The status ("queued", "printed" etc.) of all film jobs of the selected camera is shown.

Only non-rewritable CDs, i.e. CD-Rs, can be used. Rewritable CDs (CD-RWs) are not accepted.

The DICOM viewer is started directly from the CD; no files are installed on the computer.





Burning CDs

As your system is configured for multi-session, you can store your data to unrecorded CD-Rs, or CD-Rs that have already been written to. The new data is added to the old data on the CD-R.

❏ DICOM Viewer
In the first session, a DICOM viewer is written to the CD together with the image data. This allows you to view the images stored on the CD on any computer.

Exporting workflow

✧ Click the patient(s) in the **Patient Browser** (1).

✧ In the menu bar of the **Patient Browser**, click **Transfer > Export to...** (2).

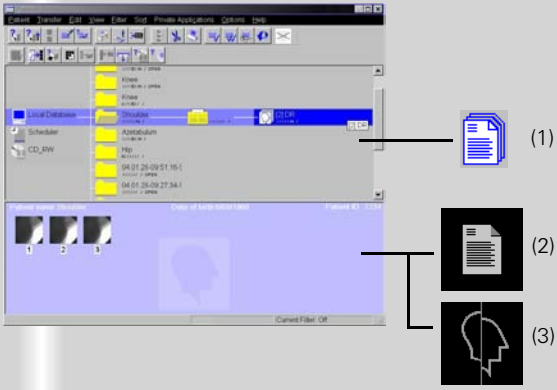
➪ The dialog window for data export is opened.

✧ Select the CD-R as the target and click **Export** (1).

✧ The export process starts. The CD is automatically labeled with the date and time.

The prerequisite for generating reports is the registration and examination of a patient.

The radiation summary report is generated automatically based on the present examination data. It cannot be postprocessed.



Generating reports

If the reporting function is enabled on your system, important examination data are automatically compiled into a structured report for documentation purposes.

Report types

- ❏ Radiation summary report
  contains the accumulated values of the examination for the number of exposures, fluoroscopy time and dose area product

Using reports

You can read, print and send the reports.

Managing reports

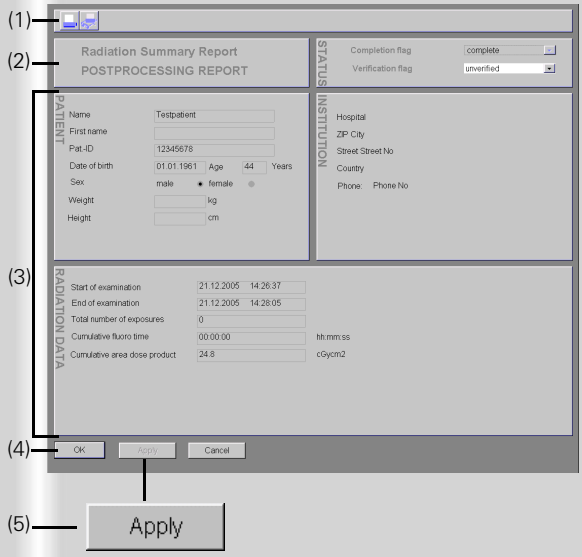
Reports are stored and managed in the **Patient Browser** as additional data objects in 2 formats. They can be selected via the relevant icons like examination images:

(1) Report icon in the navigation area

(2) Report icon in the content area
Format: Structured Report (SR)
To open the Report Editor

(3) Report icon in the content area
Format: Secondary Capture (SC)
Loading e.g. into Viewing possible; PACS-compatible

In the **Viewing** task card you can open reports by clicking the relevant button on the **Reporting** subtask card.



With this button in the Report Editor you can call up the print preview of the report.

Opening and printing reports

Opening a report

- ✧ Mark the required report in the **Patient Browser**.
- ✧ Select **Reporting > Open Report**.
- ➪ The report is opened in the Report Editor.

Report Editor

(1) **Print Report** button

(2) Status area (report status)
Examination report (treatment in process)
Postprocessing report (treatment finished)

(3) Content area

(4) Button area

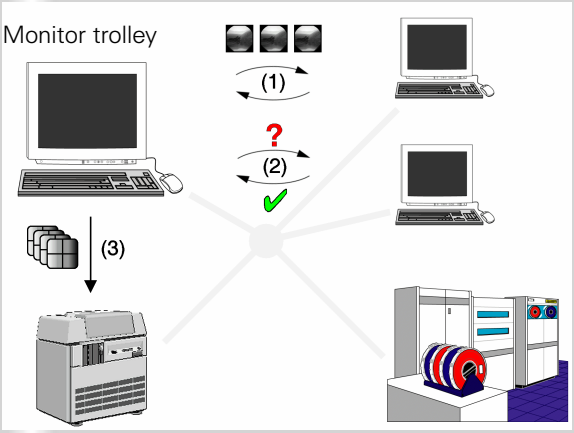
Setting the report status

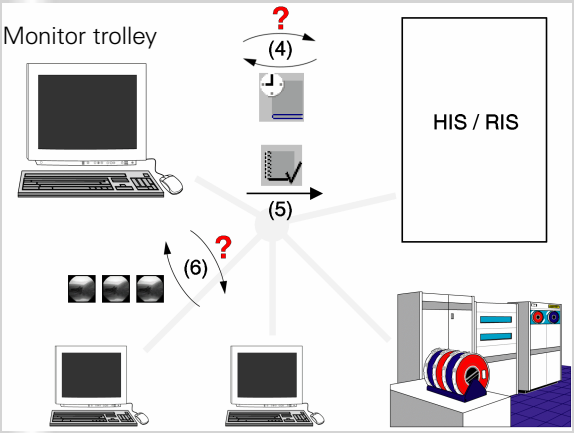
- ✧ Select the applicable status in the selection lists of the status area (2).
- ✧ Click **Apply** (5).

Printing

A report must have the „verified“ status before it can be printed.

- ✧ Click **Print Report** (1).
- ✧ Click **OK** in the dialog window displayed.


Monitor trolley
(1)
(2)
(3)


Monitor trolley
(4)
(5)
(6)
HIS / RIS

ARCADIS can optionally be connected to a network. The following two variants are available:

DICOM System Basic
Send/Receive + Storage Commitment, Print

(1) Send/Receive
Sending and receiving of patient images

(2) Storage Commitment
Requesting a confirmation that images have been securely stored after sending

(3) Print
Printing of patient images on X-ray films via a network
→ Page 69

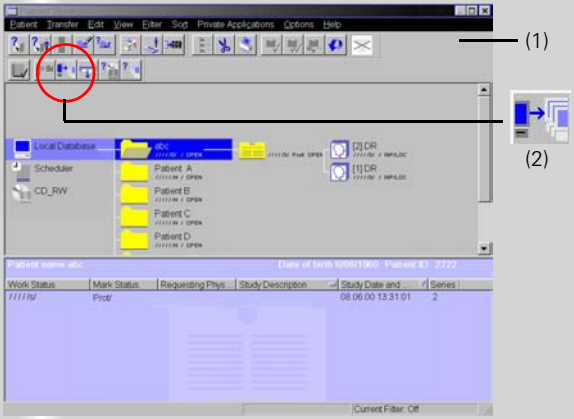
DICOM System Advanced
(in addition to the above-named functions)

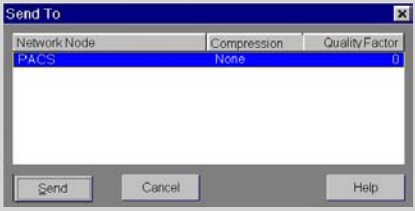
(4) Worklist
Querying the worklist (all patients for a system) and loading the patient data

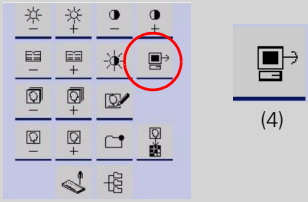
(5) MPPS = Modality Performed Procedure Step
Feedback to an information system about the status of a work process

(6) Query/Retrieve
Searching for images in the network (incl. other modalities), importing of images into the local database

You can also receive images from another system (CT, MR etc.) or workstation. For this, the images have to be actively sent from this system or workstation to ARCADIS.







Send/Storage Commitment

The **Send to** function allows you to archive patient images in an information system or to send them to another workstation for post-processing.

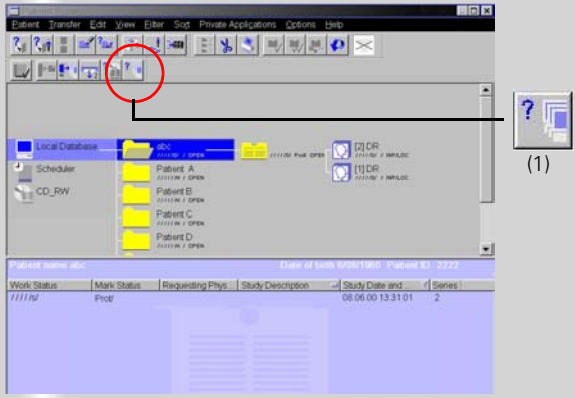
Send to

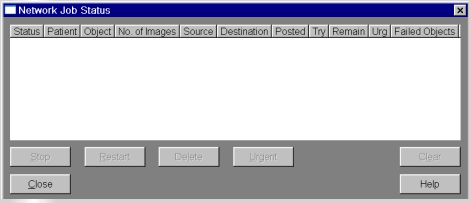
- ✧ Open the **Patient Browser** (1).
- ✧ Select the patient (or individual examinations) whose data you want to send.
- ✧ Click the **Send to...** button (2).

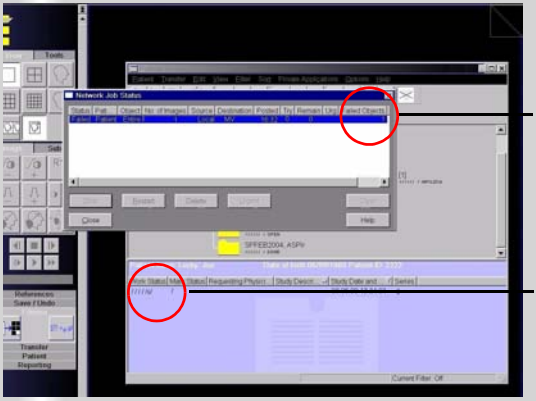
- ✧ Select the network node (recipient) and confirm with **Send** (3).
- ➲ The images are sent to the selected address (information system or workstation).

Sending to a standard address

- ✧ Press the **Send** key on the symbol keypad of the monitor trolley (4).
- ➲ The selected patient images are sent to the first "standard" node configured by Siemens Service.


(1)


Network Job Status
Status
Patient
Object
No. of Images
Source
Destination
Posted
Try
Remain
Urg
Failed Objects
Stop
Restart
Delete
Urgent
Clear
Close
Help
(2)


(3)
(4)

Tracking network processes

✧ Click the **Network Status** button (1).

➲ Current processes in the network are shown (2).

Storage Commitment

If patient data are sent or archived in an information system, the **Storage Commitment** function requests a confirmation from the receiving station that images have been securely stored (confirmation is not necessarily sent promptly):

(3) Column for error messages

(4) Feedback in the status bar ("SV" = sent and verified)

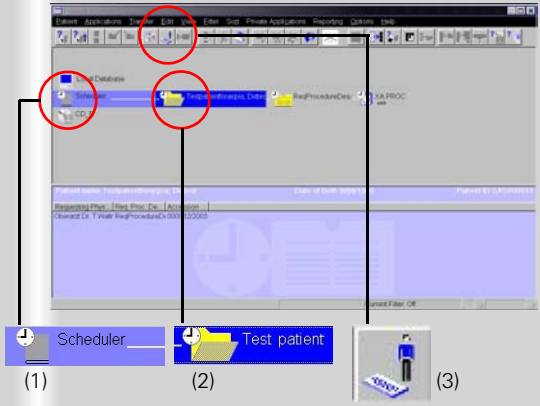
➲ In the case of an error message, the data in the **Patient Browser** must not yet be deleted, because they have not yet been properly saved or archived.

✧ Repeat the process again.

Get Worklist offers the advantage of a simplified workflow:

In an information system, the OR plan (i.e. which patients are planned for a certain operating room or C-arm) can be prepared a day ahead and retrieved in the OR.
The patient data can then be retrieved just before the intervention and transferred to the **Examination** task card.

The **Get Worklist** function also prevents the entry of incorrect patient data, since the data do not need to be entered manually.



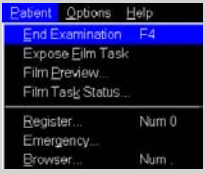
To update the worklist again, initiate a new request to the information system by double-clicking on the Scheduler.

Get Worklist

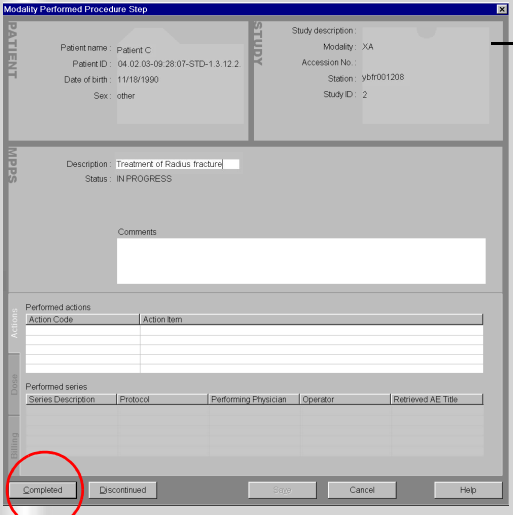
The **Get Worklist** function contains a request for a worklist within an information system.

- ✧ Double-click the **Scheduler** in the **Patient Browser** (1).
- ➪ A worklist containing the patients to be examined at this system appears.
- ✧ Select the patient to be examined in the **Scheduler** (2).
- ✧ Click the **Patient Registration** button (3).
- ➪ The **Patient Registration** window opens. The data of the selected patient have already been entered.

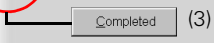
- ✧ Click **Exam** in the **Patient Registration** window (4).
- ➪ The data are transferred to the **Examination** task card, and the examination can be started.


Patient Options Help
End Examination F4
Expose Film Task
Film Preview...
Film Task Status...
Register... Num 0
Emergency...
Browser... Num .

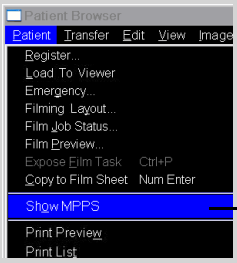
(1)


Modality Performed Procedure Step
PATIENT
Patient name : Patient C
Patient ID : 04.02.03-09:28:07-STD-1.3.12.2
Date of birth : 11/18/1990
Sex : other
STUDY
Study description :
Modality : XA
Accession No. :
Station : vbfr001208
Study ID : 2
MPPS
Description : Treatment of Radius fracture
Status : IN PROGRESS
Comments
Performed actions
Action Code
Action Item
Performed series
Series Description
Protocol
Performing Physician
Operator
Retrieved AE Title
Completed
Discontinued
Cancel
Help

(2)


Completed

(3)


Patient Browser
Patient Transfer Edit View Image
Register...
Load To Viewer
Emergency...
Filming Layout...
Film Job Status...
Film Preview...
Expose Film Task Ctrl+P
Copy to Film Sheet Num Enter
Show MPPS
Print Preview
Print List

(4)

MPPS – Modality Performed Procedure Step

MPPS (Modality Performed Procedure Step) is a confirmation to an information system that a certain process (in this case the examination of a patient) has been completed.

Calling up MPPS after an examination

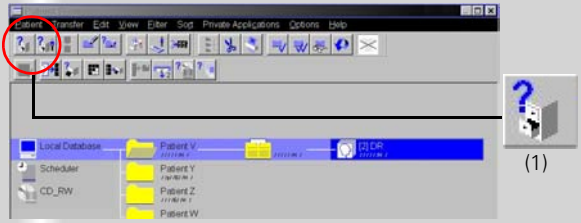
- ✧ Select **Patient > End Examination** in the **Examination** task card (1).
- ➪ The MPPS dialog is displayed (2).
- ✧ If desired, enter information and comments on the procedure (e.g. unusual occurrences, complications).
- ✧ To end the dialog, click **Completed** (3).
- ➪ The OR documentation is sent to the information system, where it is archived.
- ➪ The patient is deleted in the Scheduler.

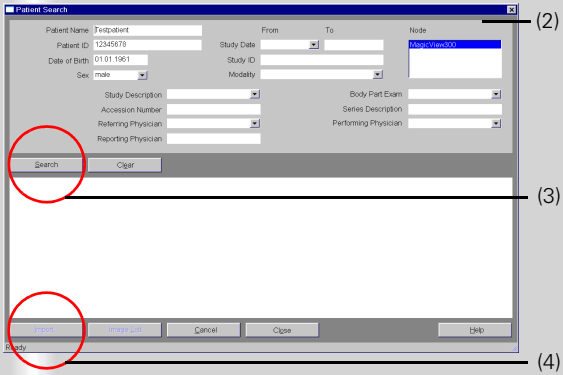
Calling up MPPS manually

If you have accidentally closed the patient by registering a new patient, you can open the MPPS dialog manually.

- ✧ Select **Patient > Show MPPS** in the menu bar of the **Patient Browser** (4).

The *Retrieve* function is important above all for preoperative images that are needed for virtually any procedure.





Query/Retrieve

- ❏ Query
  A query to an information system can be started. If the patient is already known to the information system, the existing images are displayed.
- ❏ Retrieve
  Images can be imported into the local database and loaded into the **Viewing** task card.

✧ Click the **Search** button in the **Patient Browser** (1).

➲ The search dialog opens (2).

✧ Enter the known patient data (unknown data can be replaced by the * wildcard, e.g. A*).

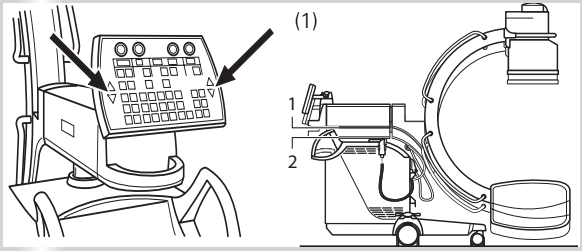
✧ Start the search by clicking **Search** (3).

➲ The patient images present in the information system are displayed.

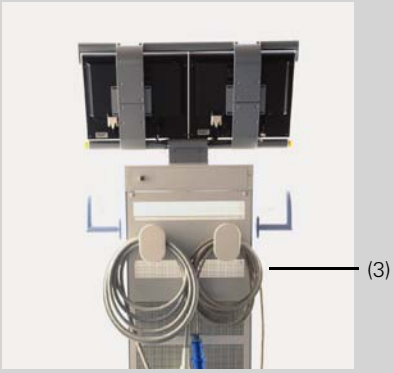
✧ Click the **Import** button (4).

➲ The patient images are imported into the local database from where they can be loaded into the **Viewing** task card.

The C-arm can only be moved while it is switched on.



To define the switch-on duration yourself, you can perform a full shut-down manually. To do so, select **Options > End session** in the main menu before turning the system off.



Transport position

The C-arm system should be transported and parked in a zero position.

- ✧ Move the C-arm to the 0 position for angulation, horizontal movement and swivel.
- ✧ Move the C-arm into an orbital a.p. position.
- ✧ Move the lifting column all the way down into position 2 (1).
- ✧ Lock all electronic brakes.

Switching off

- ✧ Switch the unit off at the monitor trolley (2).
- ➪ The imaging system is shut down and switched off in the "hibernate" state. Switching the system back on takes approx. 45 secs. until it is fully operational.

- ➪ The 16th time the system is switched off, it is automatically completely shut down. Switching the system back on then takes approx. 3 mins. until it is fully operational.

- ✧ Disconnect the monitor trolley from the C-arm system.
- ✧ Roll up the cables at the rear of the monitor trolley (3).
- ➪ The C-arm system is ready for transport.

Notes

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We make every effort to continuously improve our product documentation.

Therefore, we would like to offer you the opportunity of giving us your direct feedback concerning your requests, suggestions and criticism with respect to this Quick Guide.

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Siemens AG
Wittelsbacherplatz 2
D-80333 München, Germany

Contact:
Siemens AG, Medical Solutions
Special Systems
Henkestraße 127
D-91052 Erlangen, Germany

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